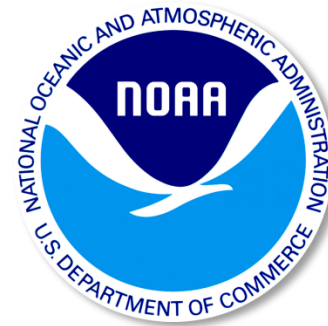


Winter 2016-17 Outlook

Summer 2017 Preview

Mark O'Malley



National Weather Service
Phoenix, AZ

www.weather.gov/phoenix

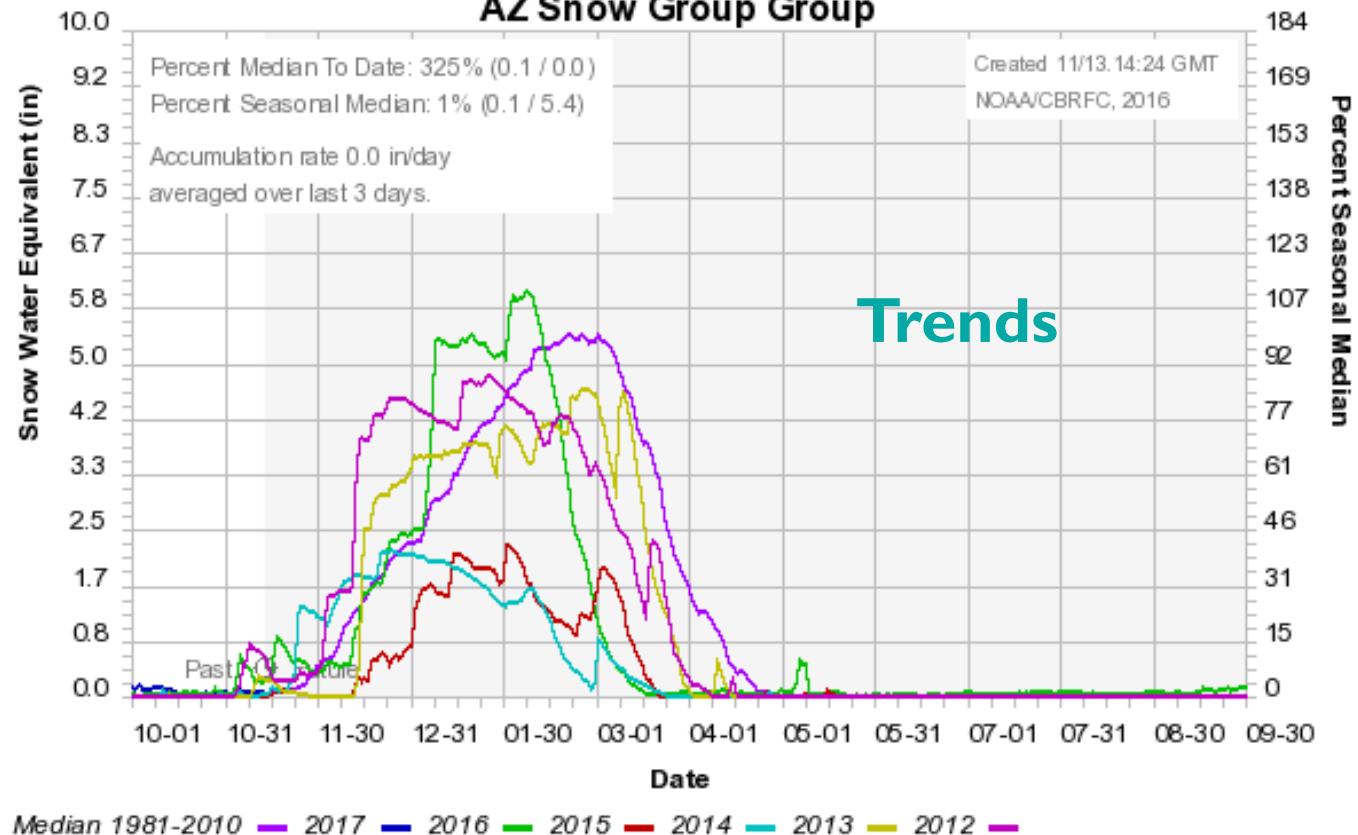


What may affect Arizona winter weather and water supply?



NOAA/ESRL Physical Sciences Division

Colorado Basin River Forecast Center AZ Snow Group Group

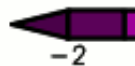


H
blocking
high pressure

Weak

Core of below
average SS

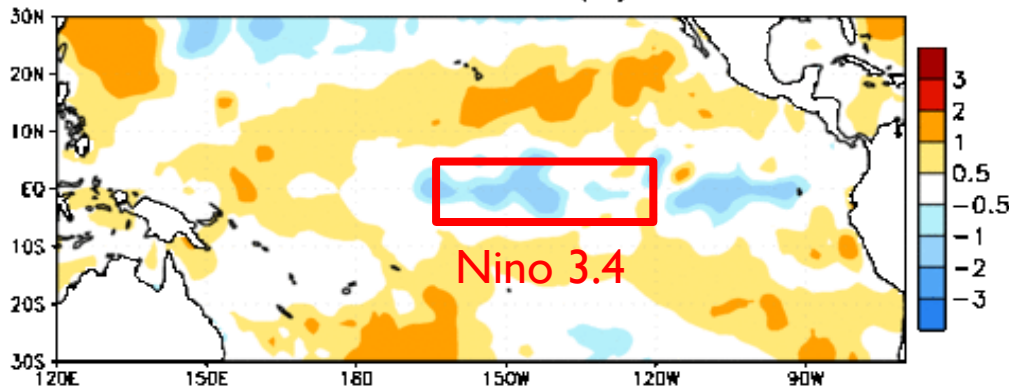
**Positive
PDO**



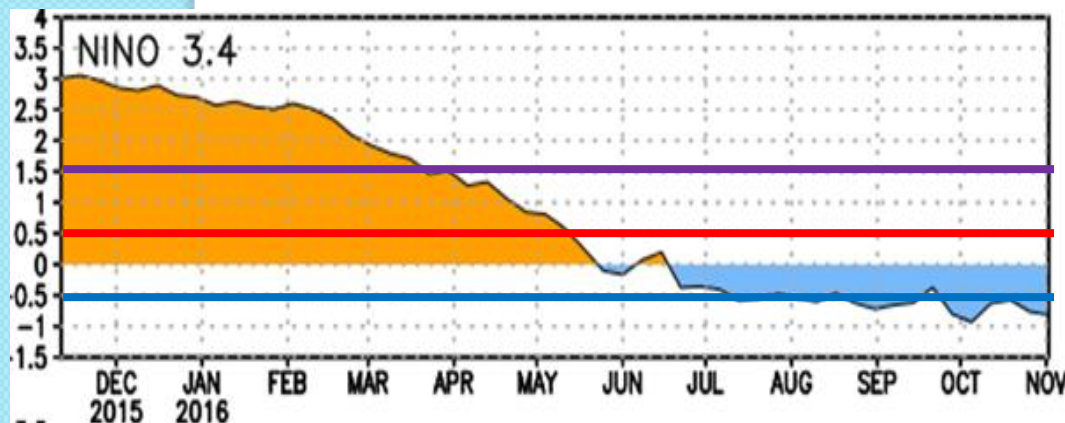


Conditions in Tropical Pacific

Week centered on 17 AUG 2016
SST Anomalies (°C)



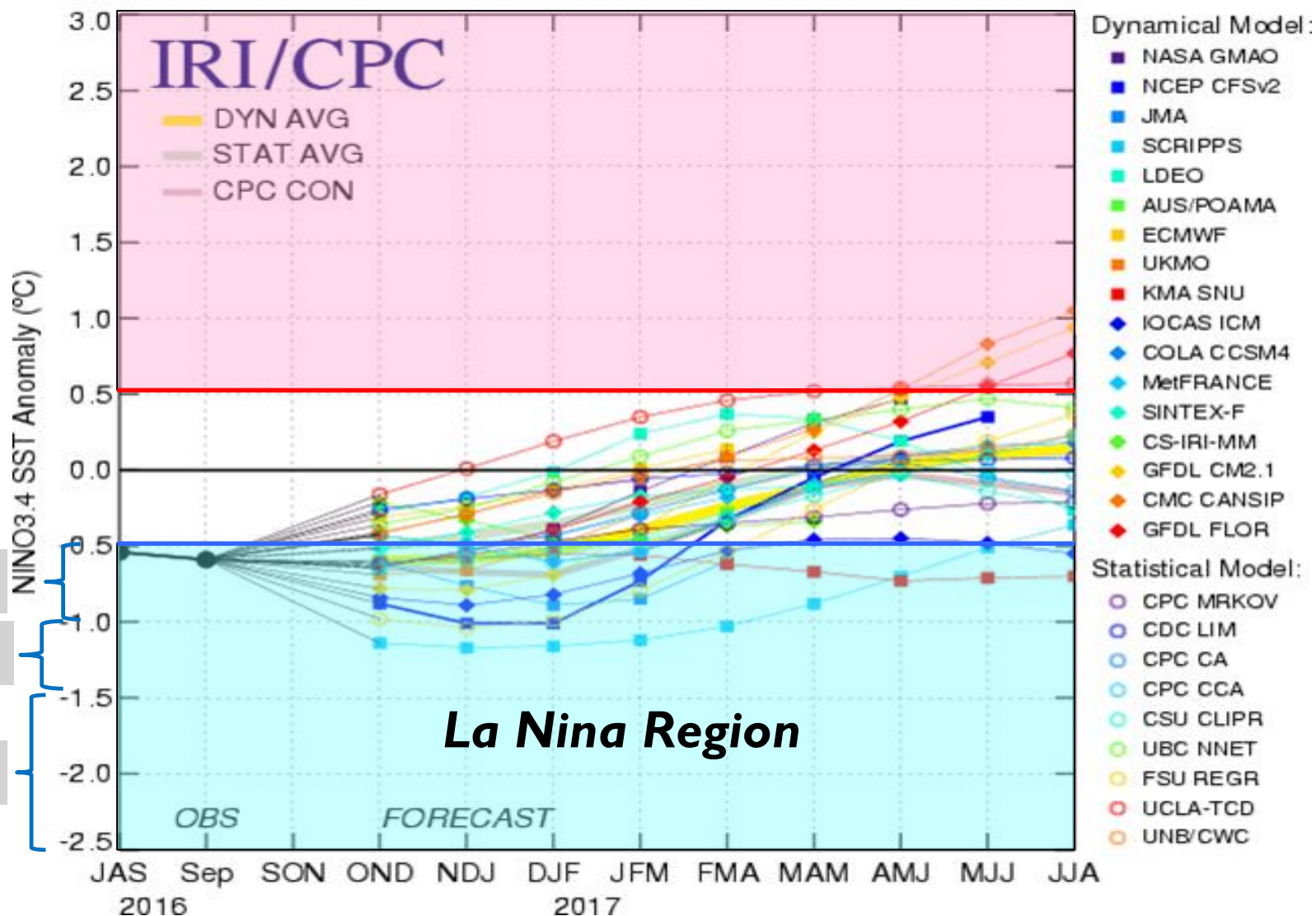
- Equatorial central Pacific waters have been cooling since the strong El Nino peaked at the end of 2015
- Sea surface temperatures (SST) cooled to neutral levels by late spring 2016
- SST's have persisted near the -0.5°C La Nina threshold since late summer and will hover around this level for the next several months





La Nina Outlook – Oct 2016

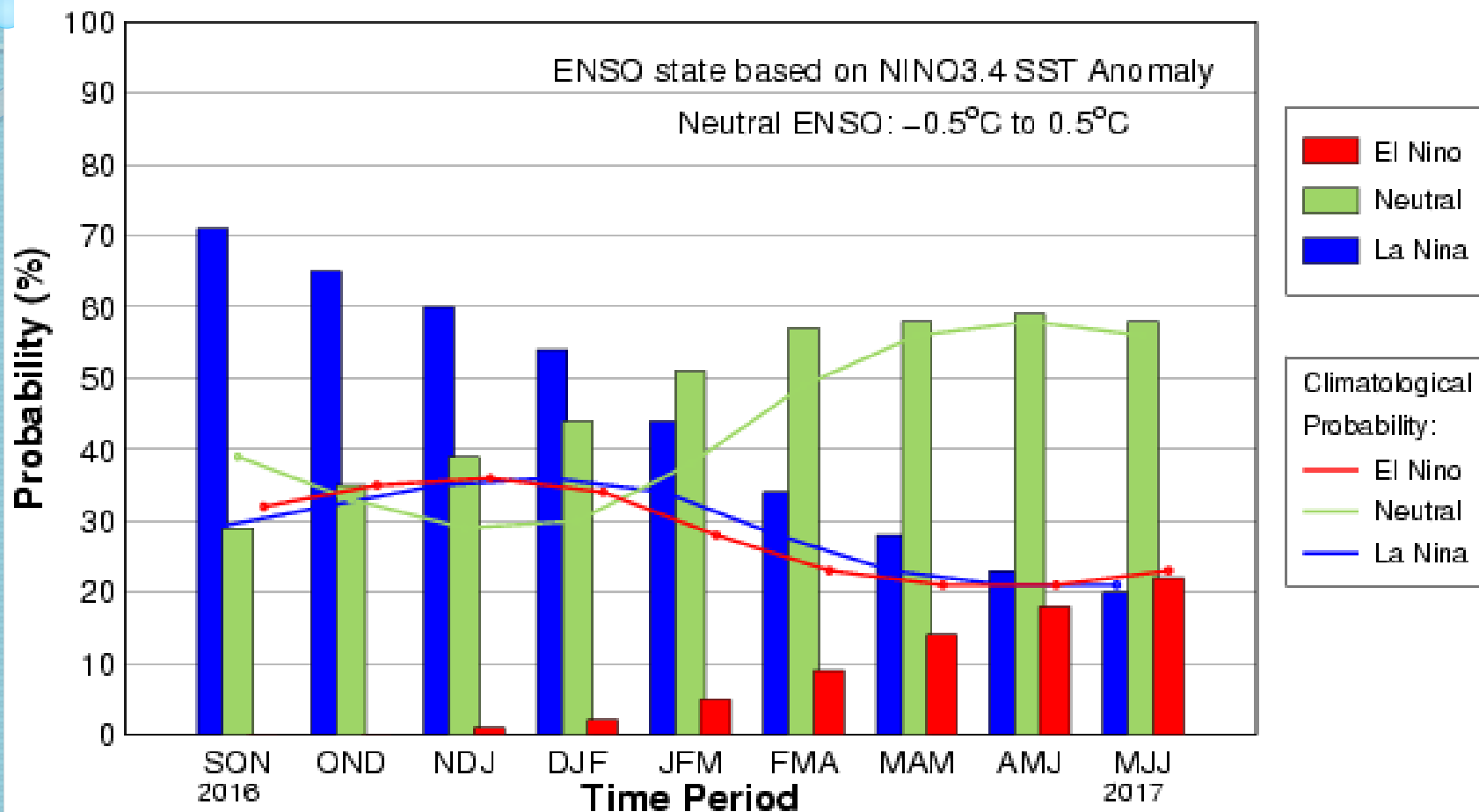
Mid-Oct 2016 Plume of Model ENSO Predictions

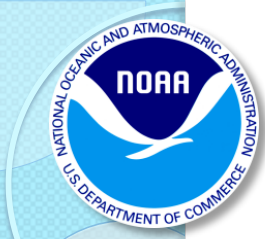




La Nina Outlook – Oct 2016

Early-Oct CPC/IRI Official Probabilistic ENSO Forecast





Jan-Feb-Mar La Nina Precipitation Distribution (in) for Arizona

KEY

Upper
1/3 cases

Middle
1/3 cases

Lower
1/3 cases

90%tile

67%tile

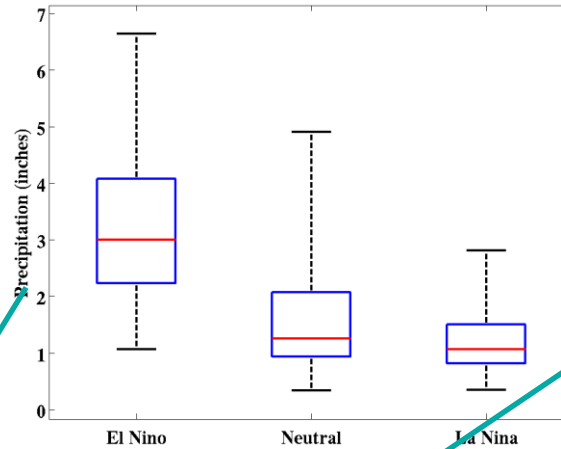
Median

33%tile

10%tile

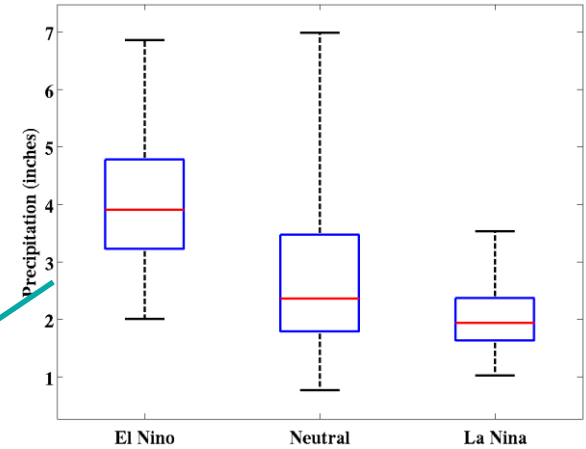
Climate Division 95

JFM Precipitation Distribution for Climate Div. #095



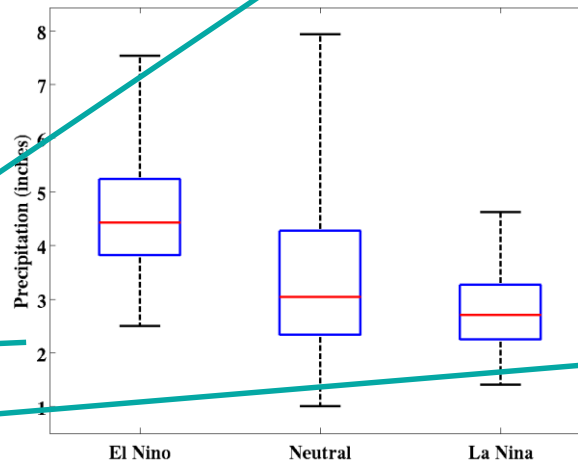
Climate Division 96

JFM Precipitation Distribution for Climate Div. #096



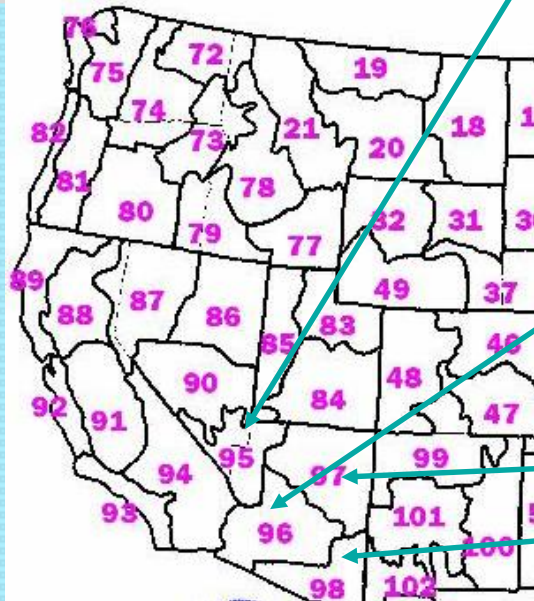
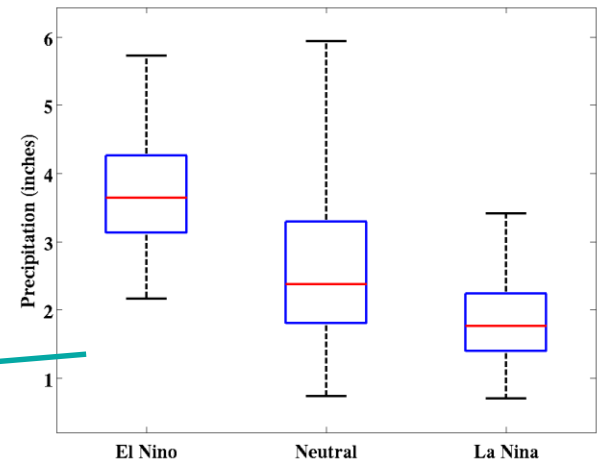
Climate Division 97

JFM Precipitation Distribution for Climate Div. #097



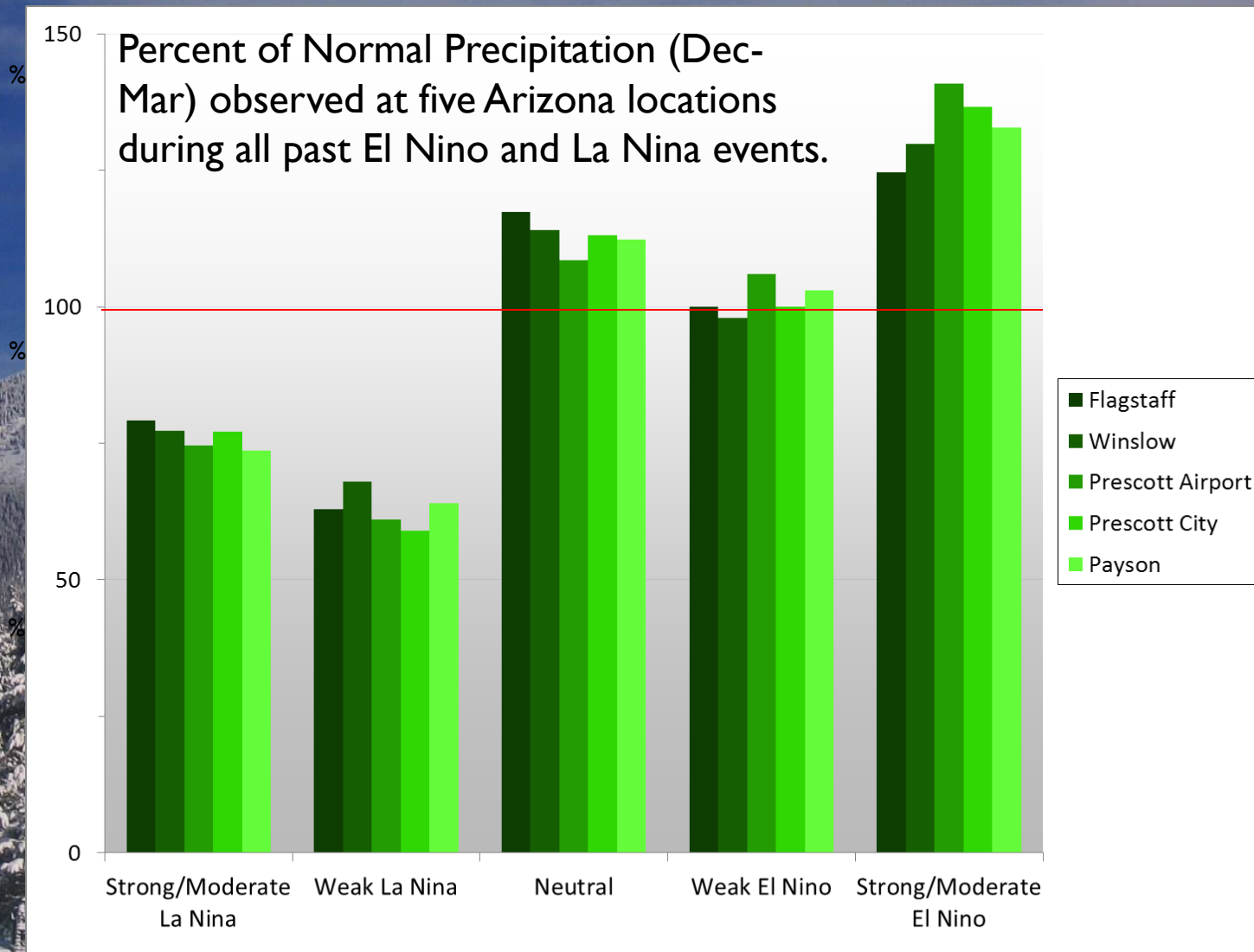
Climate Division 98

JFM Precipitation Distribution for Climate Div. #098



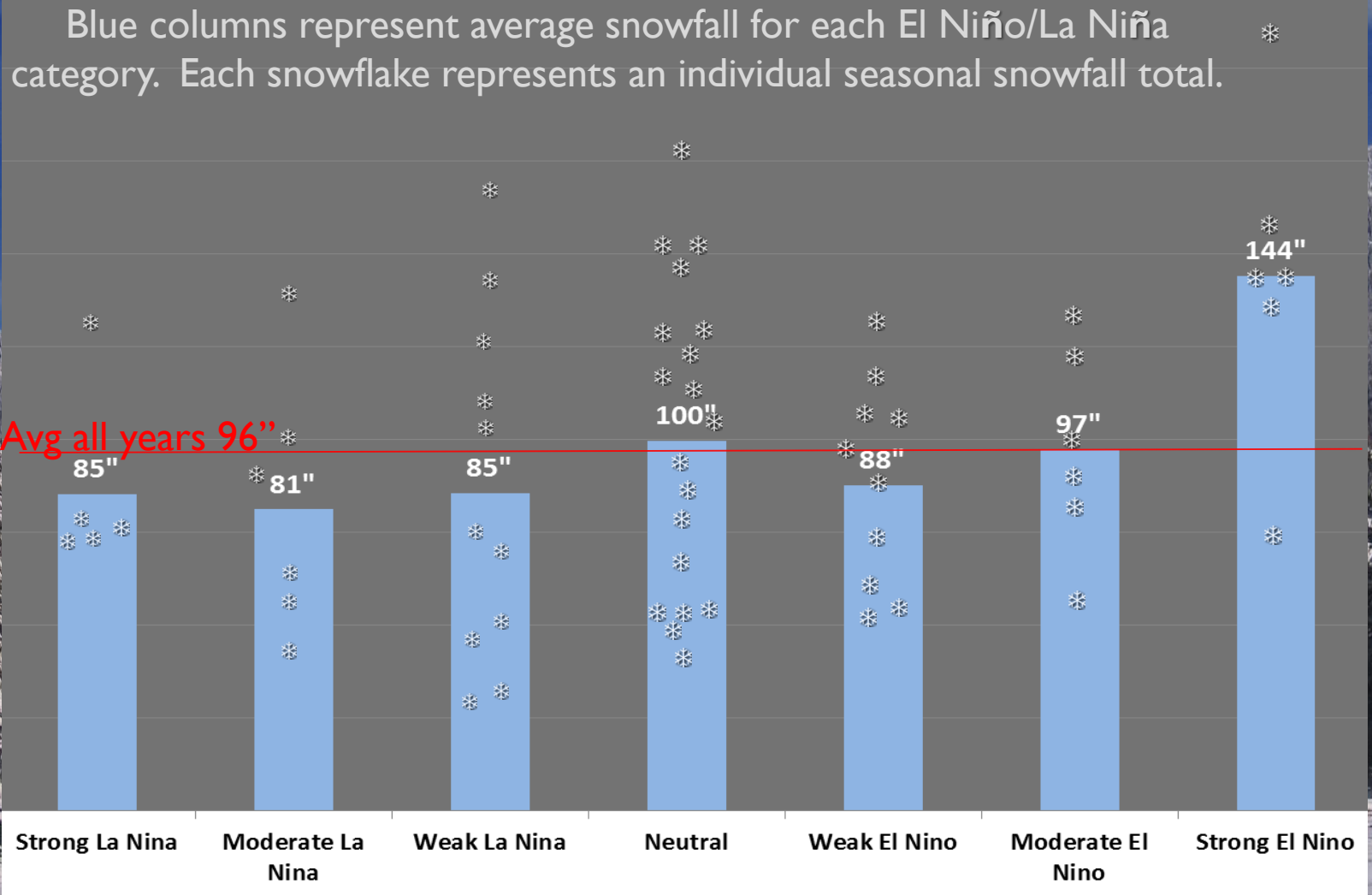


Winter Precipitation





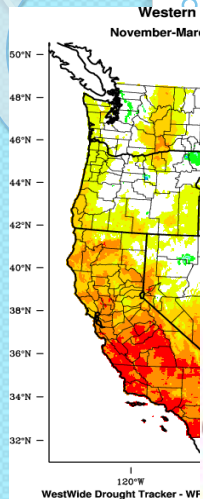
Seasonal Snowfall at Flagstaff



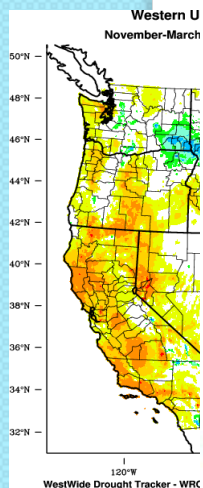


Comparable Recent La Nina/Neutral Winters

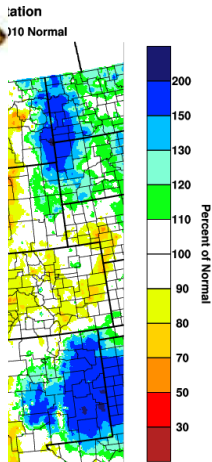
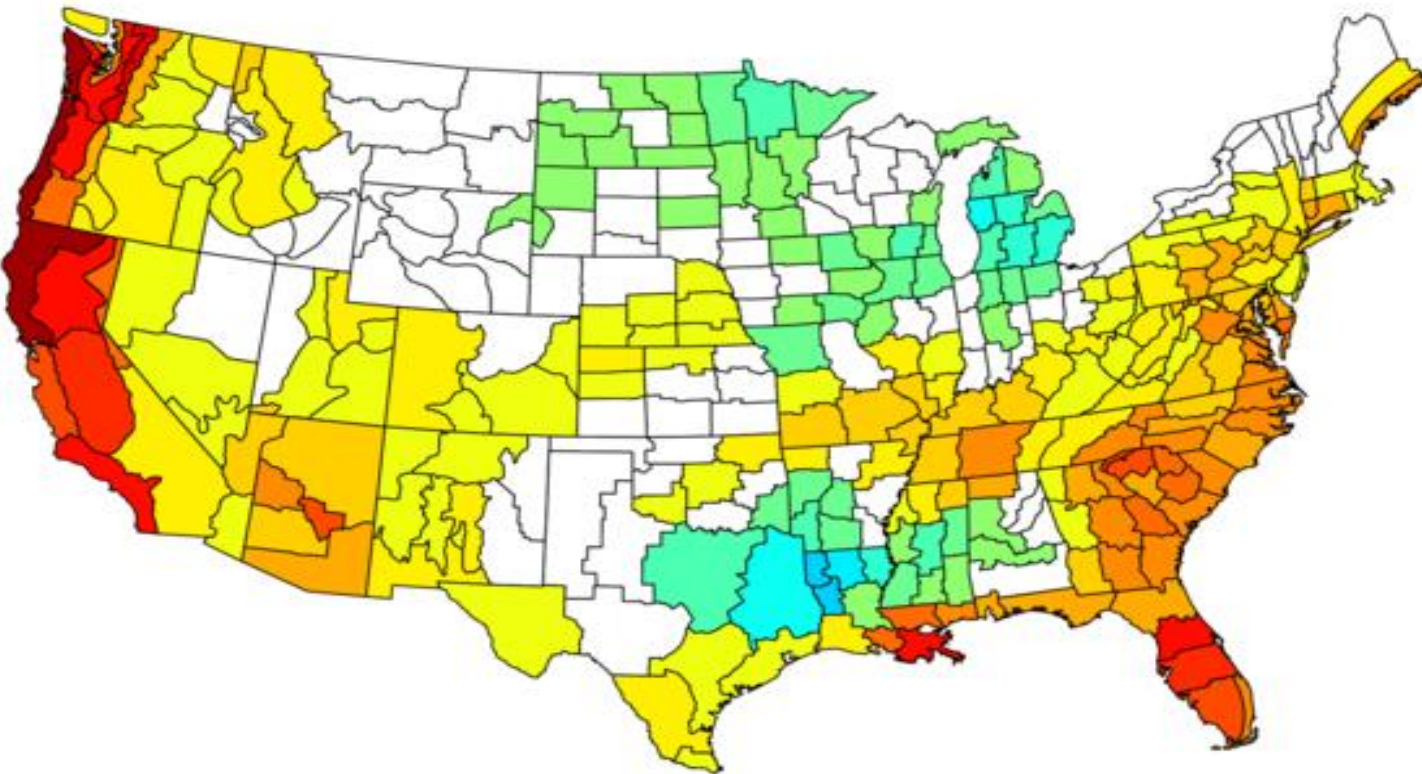
NOAA/NCDC Climate Division Composite Precipitation Anomalies (in)
Nov to Mar 2000-01, 2005-06, 2008-09, 2011-12, 2013-14
Versus 1950-1995 Longterm Average



20

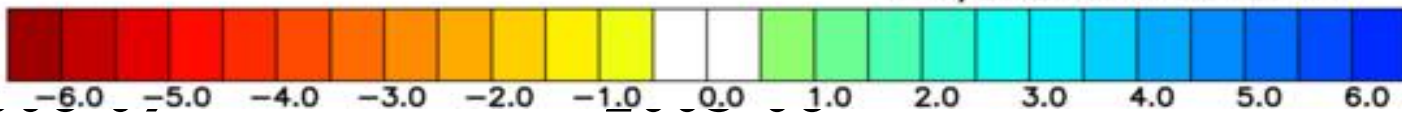


20



inal, created 15 DEC 2014

NOAA/ESRL PSD and CIRES-CU

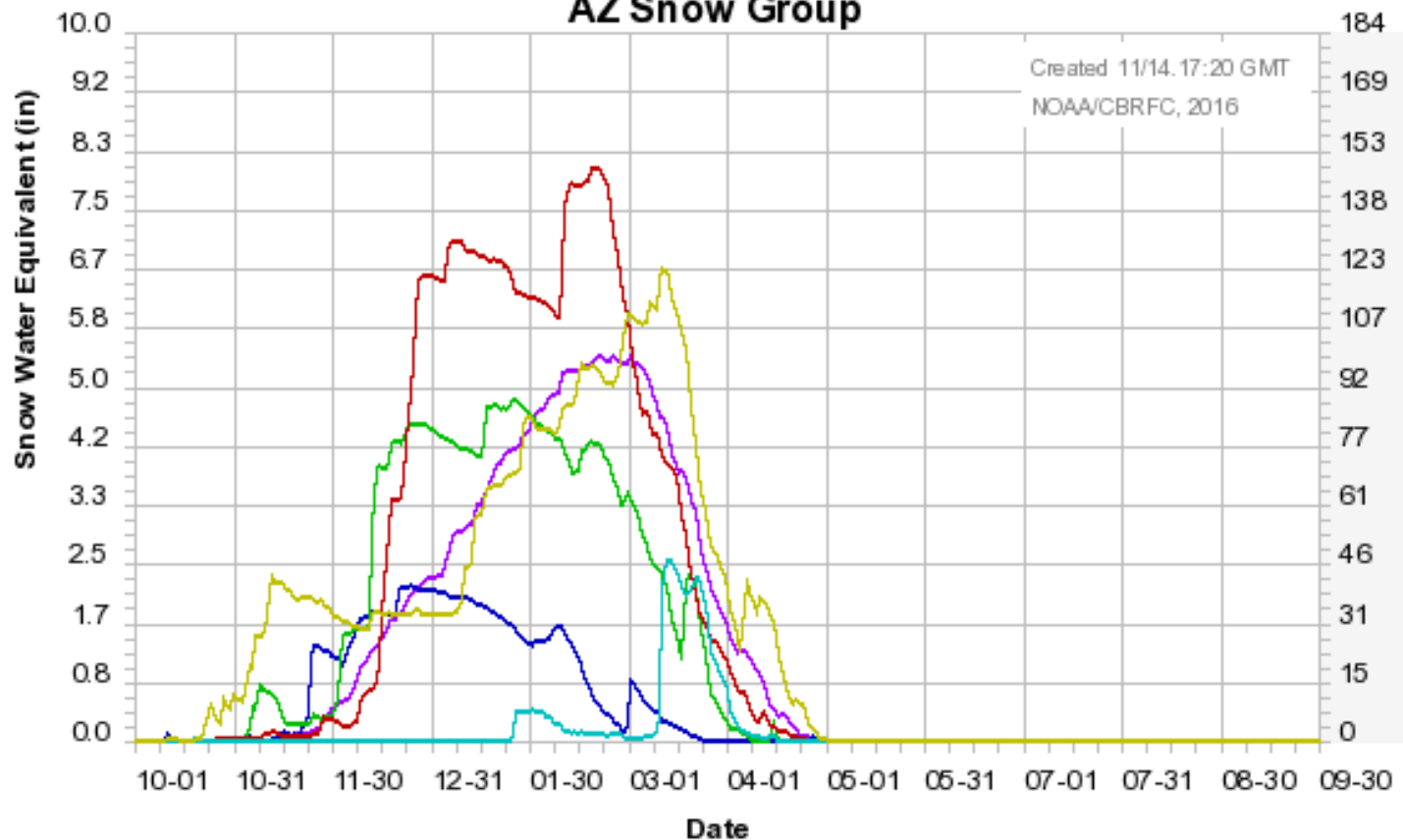
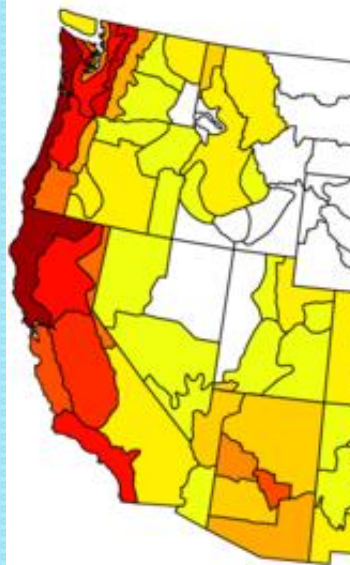




Comparable Recent La Nina/Neutral Winters

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Nov to Mar 2000-01, 2005-06, 2008-09, 2011-12, 2013-14
Versus 1950-1995 Longterm Average

Colorado Basin River Forecast Center AZ Snow Group



Median 1981-2010 2014 2012 2009 2006 2001

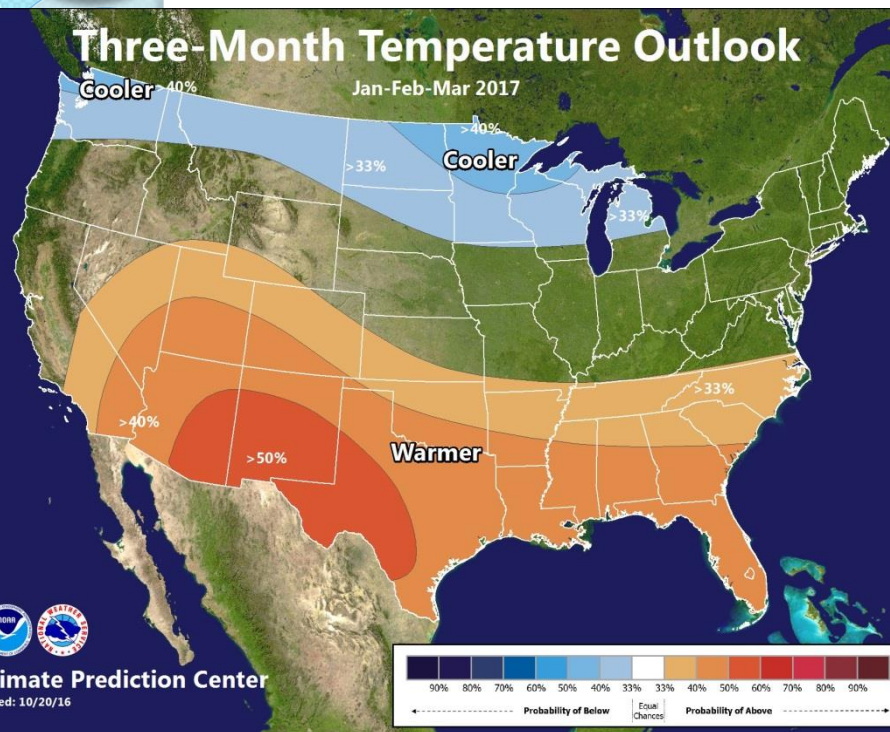
Created 11/14, 17:20 GMT
NOAA/CBRFC, 2016



Outlook: Jan/Feb/Mar 2017

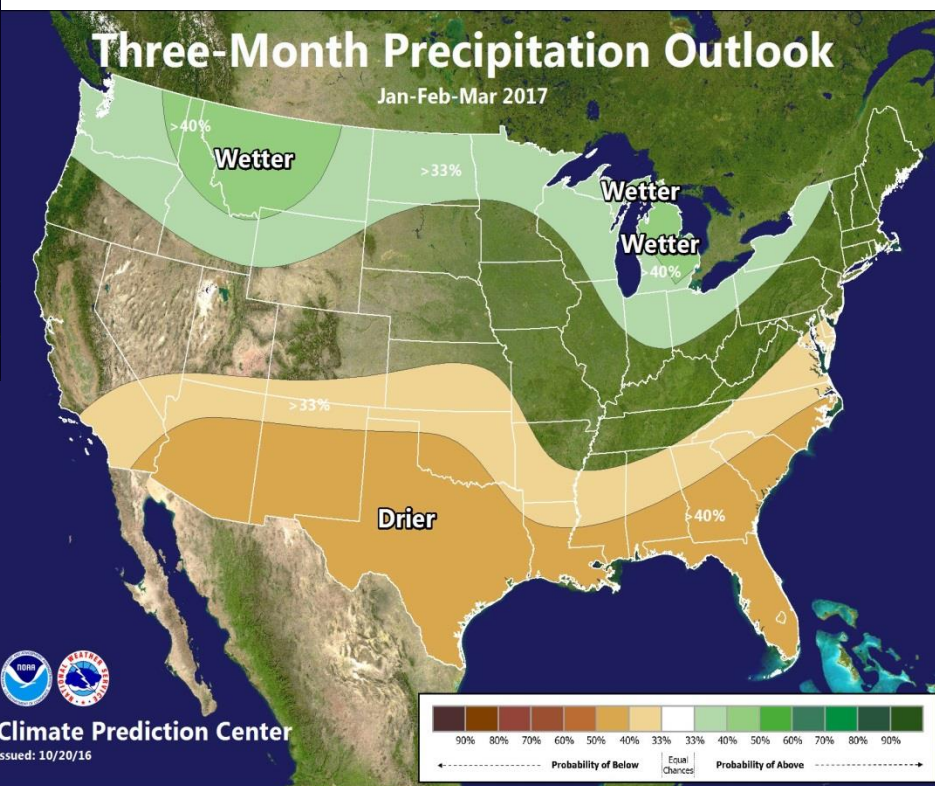
Three-month averages

Shading indicates chances of above/below normal



Much better odds for above normal temperatures

Better odds of below average precipitation

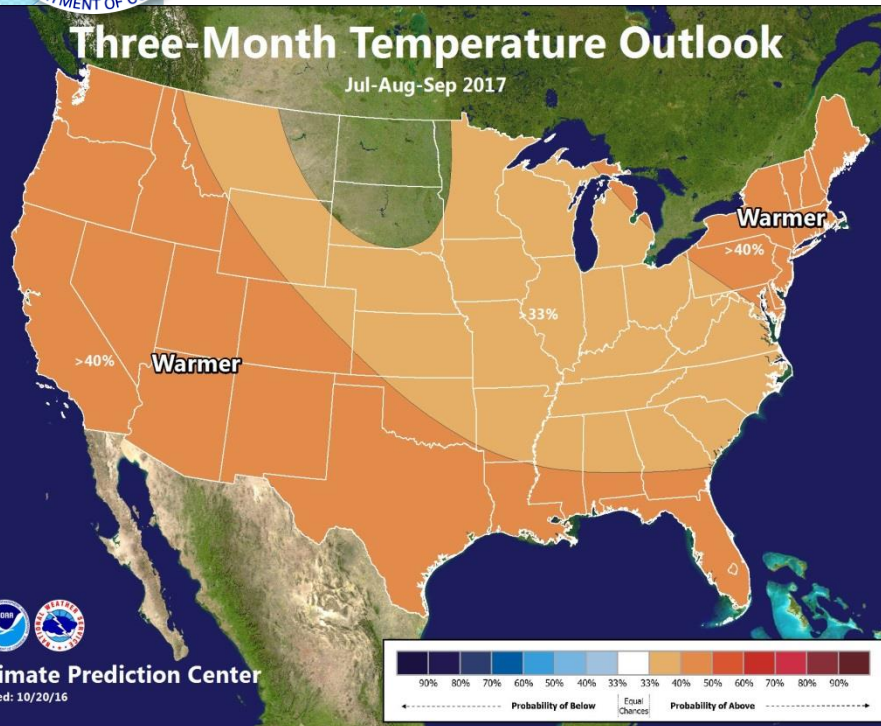




Outlook: Jul/Aug/Sep 2017

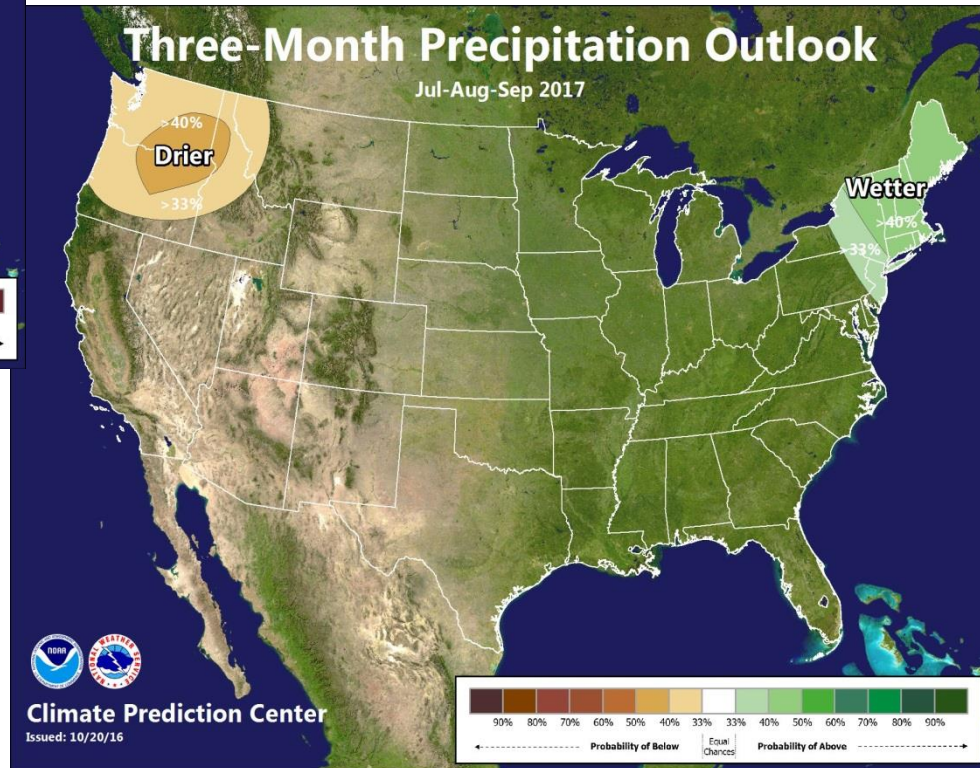
Three-month averages

Shading indicates chances of above/below normal



Temperatures most likely warmer than normal

No tilt in odds for precipitation totals





Summary

- The outlook for winter 2016-17 indicates weak La Nina conditions early in the winter becoming neutral late in the winter
- Weak La Nina episodes are not always the best predictor for seasonal weather in Arizona with wide ranges of outcomes possible
- Odds are shifted towards a **warmer and drier than normal winter** based on a combination of La Nina, model output, and trends over the past 10-15 years
- Mountain snows may favor less than average amounts, but the correlations and analysis are not definite
- The 2017 summer outlook favors better chances for above normal temperatures, but no precipitation signal



Questions? Contact us!

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